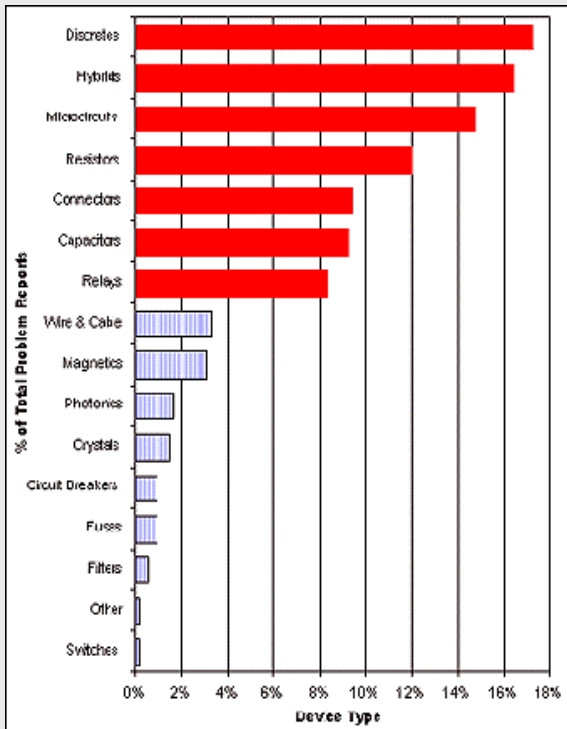


The NASA Electrical, Electronic, and Electromechanical (EEE) Parts Assurance Group

By Michael J. Sampson, Goddard Space Flight Center,
and Jeannette Plante, Dynamic Range

NASA recently noticed that retirements and reassignments had significantly drained the Agency's pool of commodity specialists. To reinvigorate EEE parts assurance processes across the Agency, the Office of Safety and Mission Assurance at NASA Headquarters formed the NASA Electronic Parts Assurance Group (NEPAG) in 2000 with the support of the Office of the Chief Engineer. NEPAG is developing methods and tools to make the most efficient use of the Agency's parts engineering resources and to maintain core parts engineering competencies. The chart below shows the results of a Pareto diagram for the sources of parts concerns from 1991 to 2000. Seven commodities represent 88% of problems and should therefore get top priority for valuable resources.



YOUR PREPAREDNESS FOR AN AUDIT OF NASA PARTS POLICY REQUIREMENTS WITH SAMPLE AUDIT GUIDE QUESTIONS.

MANAGEMENT:

1. What controls are in place for selection and procurement of EEE and Mechanical Parts at the Center?
2. Do these controls assure that parts selection includes consideration of the part's intended use including but not limited to environment, performance, criticality and lifetime requirements?
3. How does the Center or Mission Directorate assure that supplier audits are available to the programs?

GENERAL:

1. Who is the Program or Project Parts Engineer(s) assigned to your program?
2. How does your program identify qualified parts suppliers?
3. How often does your program select parts from the NPSL?
4. Does your program have access to supplier audits, and does your program use this data to select parts suppliers?

Visit the NASA Parts Selection List at:

<http://nepp.nasa.gov/npsl/>

NASA Office of Safety and Mission Assurance
300 E Street SW
Washington DC 20024-3210
Phone (202) 358-0521
www.hq.nasa.gov/codeq

Publication March 23, 2005



NASA SAFETY AND MISSION ASSURANCE REQUIREMENTS

NPD 8730.2

NASA Parts Policy

Compliance Verification Guide



OFFICE OF SAFETY AND MISSION ASSURANCE

This brochure is intended to be used as a guide only, not as a replacement for the actual policy. To review the NASA Parts Policy (NPD 8730.2) in its entirety, see <http://www.hq.nasa.gov/codeq/doctree/texttree.htm>.

Why do we have a NASA Parts Policy?

To control risk and enhance reliability in NASA spaceflight and critical ground support systems.

Who Is Responsible For The NASA Parts Policy Program?

► Mission Associate Administrators and Center Directors

- Assure that Center parts management procedures are developed, documented, and implemented.
 - Objective Quality Evidence (OQE) – Procedures and Records
- Assure that appropriate EEE parts and electric packaging and mechanical parts requirement are applied on NASA contracts.
 - OQE – Contracts

► Chief Safety and Mission Assurance Officer

- Assures that effective processes and controls are in place for EEE and Mechanical Parts within the NASA Mission and at the Centers.
 - OQE – Center and Mission NPD, NPR, Standards

KEY MILESTONES IN U.S. SPACE QUALITY PARTS

- 1958-62 Commercial and military parts with stringent incoming tests and inspection.
- 1968 NASA Microcircuit Line Certification Program (Later MIL-STD-976); MIL-STD-883 was published.
- 1976 The NASA Standard Parts Lists (MIL-STD- 975) was published.
- 1979 NASA Parts Application Handbook (MILHDBK-978) was published.

MINIMUM AUDIT POINTS FOR NPD 8730.2

Roles And Responsibilities

► NASA

- Shall select parts and packaging based on their intended use considering, but not limited to, performance, environment, criticality, and lifetime requirements.
- OQE – Parts Selection Policy, Process and Procedures
- Shall document the de-rating criteria for parts.
- OQE – Documented De-rating Criteria
- Shall utilize the results of surveys/audits performed by other Centers or third-party auditors as a means to determine capability and qualification of sources and suppliers of parts.
- OQE – Audit Results, Source Qualification Process And Procedures
- Shall coordinate procurement of parts among programs/Centers whenever feasible
- OQE – Purchase and Procurement Records
- Assures that appropriate EEE parts, electronic packaging, and mechanical parts requirements are applied n NASA contracts.
- OQE – Contracts
- Selects, tailors (i.e. adapts) and specifies standards required to meet defined application needs to avoid over specification or imposition of inappropriate requirements. Tailoring shall be documented to maintain traceability to the original standard, and the level of authority for approval of tailoring shall be appropriate to the level of application risk.
- OQE – Plans and Records

► Mission Associate Administrators and Center Directors

- Assure that the results of supplier audits/surveys, qualification testing, risk assessments, experience data, parts data, use of the NPSL, and production line certifications are provided to other Centers and to the Government-Industry Data Exchange Program (GIDEP) as appropriate
 - OQE – Correspondence With Other Center and GIDEP

Data Sharing

► NASA

- Shall maintain a NASA Parts Selection List (NPSL) to provide candidate parts selections for program use.
 - OQE – NPSL

Audits

► Center Directors

- Review the process used by third-party auditors/surveyors (including those performed by other Government agencies or commercial third-party auditors) and assures the process is reviewed prior to use to determine that the process meets minimum NASA requirements.
 - OQE- Reviews and Evaluations

"Good Parts Become Bad Parts in the Wrong Application"

"20% of the failures that we have on programs, data has shown, are related to parts—directly related to parts—which really isn't the majority of the problems, but we're having major problems right now on Station because the parts that were chosen don't meet the application—there's nothing necessarily wrong with the parts, but they didn't meet what was needed of them, and so now we're redesigning—finding—having to go find a different solution for the problem. We didn't solve it initially with the parts we chose. Even though the parts themselves might be reliable, they don't meet the mission requirements."

- David Beverley, International Space Station EEE Parts Lead, NASA Johnson Space Center